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Amendments to the Claims

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This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method of predicting the occurrence of critical events in a computer cluster having a series of nodes, said method comprising:

maintaining an event log that contains information concerning critical events that have occurred in the computer cluster;

maintaining a system parameter log that contains information concerning system parameters for each node in the cluster; ~~and~~

loading the information from the event log and the system parameter log into a Bayesian network model representing the computer cluster and its nodes; and

using the Bayesian network model to ~~predicting~~ predict a future performance of a node in the cluster based upon a hybrid prediction system comprising rule based prediction criteria and time-dependent variable prediction criteria ~~said event log and said system parameter log~~.

2. (Cancelled)

3. (Original) The method of claim 1 wherein maintaining said system parameter log comprises recording a temperature of a node in the cluster and a corresponding time value.

4. (Original) The method of claim 1 wherein maintaining said system parameter log comprises recording a utilization parameter of a central processing unit of a node in the cluster and a corresponding time value.

5. (Currently amended) The method of claim 1 further comprising

aligning the events;

categorizing the events according to time-dependency; and

filtering said event log and said system parameter log such that some critical event information and some system parameter information is eliminated in order to reduce storage requirements of the cluster ~~not maintained in said event log and said system parameter log~~.

6. (Original) The method of claim 1 comprising using a time-series mathematical model to predict future values of said system parameters.

7. (Original) The method of claim 1 comprising using a rule based classification system to predict future critical events based upon said critical event information and said system parameter information.

8. (Currently amended) The method of claim 1 wherein the step of predicting comprises forming a warning window only for each node in the cluster in which at least one error has occurred in order to reduce system requirements, wherein ~~such that~~ said warning window ~~contains~~ comprises a predicted performance parameter or critical event occurrence for the node for a predetermined future period of time.

9. (Currently amended) A method of improving the performance of a computer cluster having a series of nodes, said method comprising:

monitoring the occurrence of critical events in said nodes in said computer cluster;

monitoring system performance parameters of said nodes in said computer cluster;

creating a node representation for each node in said computer cluster based upon said monitoring;

creating a cluster representation based on said node representations;

periodically examining said node representations to predict future node performance; and

using said cluster representation to redistribute tasks among said nodes based upon said predicted node performance.

3

10. (Original) The method of claim 9 wherein creating said cluster representation and said node representation comprises creating a Bayesian Network that represents relationships between the occurrence of said critical events and said system performance parameters.

11. (Original) The method of claim 9 comprising saving information concerning said critical events and said system performance parameters in a database.

12. (Original) The method of claim 11 comprising filtering said saved information to remove information wherein said removed information is not determined to be useful in predicting a future performance of said nodes.

13. (Original) The method of claim 9 comprising applying a time-series mathematical model to said system performance parameters to predict future values of said system performance parameters.

14. (Original) The method of claim 13 wherein said time series mathematical model is one of an auto regression, a moving average and an autoregressive moving average model.

15. (Original) The method of claim 9 comprising using rule based classifications to associate some system performance parameters with occurrence of said critical events.

16. (Original) The method of claim 9 wherein said system performance parameters concern at least one of a node temperature, processor utilization value, network bandwidth and available memory space.

17. (Currently amended) An information processing system comprising:

       a computer cluster having a series of nodes;

a control system for monitoring critical events that occur in said computer cluster and system parameters of said nodes;

a filter mechanism for aligning, categorizing and eliminating event information;

a memory for storing information related to said occurrence of said critical events and said system parameters of said nodes; and

a Bayesian Network model for predicting a future occurrence of a critical event based upon an observed relationship between said system parameters and said occurrence of critical events.

18. (Cancelled)

19. (Original) The information processing system of claim 17 wherein said Bayesian Network comprises a time-series modeler for predicting future values of said system parameters.

20. (Original) The information processing system of claim 17 wherein said Bayesian Network comprises a rule based classification system for associating said system parameters with said occurrences of said critical events.

21. (Currently amended) The information processing system of claim 17 comprising a dynamic probe generator for

determining when it is necessary to collect additional information concerning said system parameters or said critical event occurrence; and

probing the system for the additional information.

5